

THE HARVEIAN ORATION  
1915

SIDNEY COUPLAND

(2)

BZP(HARVEY)




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# THE HARVEIAN ORATION

*Delivered before the Royal College of Physicians  
of London, on October 18th, 1915*

BY

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(2) BZP (Harvey)

To

FREDERICK TAYLOR, M.D.

PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS  
OF LONDON

THIS ORATION IS DEDICATED  
WITH SINCERE ESTEEM AND REGARD



## PREFATORY NOTE

I CANNOT let these pages go forth without an expression of my indebtedness to our late President, SIR THOMAS BARLOW, Bart., for kindly inviting me to fill this office ; and to Dr. NORMAN MOORE and Mr. D'ARCY POWER, whose writings, together with those of MICHAEL FOSTER and ROBERT WILLIS, have helped me to realise the greatness of HARVEY.

S. C.



# THE HARVEIAN ORATION

1915

**M**R. PRESIDENT, FELLOWS OF THE COLLEGE, AND GENTLEMEN,—When we listened to the Harveian Orator a year ago some of us, perhaps, still hoped that before the next Oration was delivered the world might be at peace again. Such hopes have long since died. Month by month the struggle has become more gigantic and more devastating, the field of combat wider, the combatants more numerous; and yet, it seems, we have not seen the worst of it, and no man can tell us when the end will be. It is a long-drawn trial for every Englishman, for day by day the flower of English manhood is being sacrificed to the devouring Moloch whom the Prussians have made their God. And though the thought that they have so nobly given their lives, not in the service of military despotism and national aggrandisement, but, like their forefathers who fought under Drake and Wellington, in the cause of freedom—though this thought may soften the bitterness of their loss,

it cannot fill the gap they leave in the hearts of their friends and in the ranks of English life.

To us as scientists, moreover, the war has brought its special tragedy. There are no international frontiers in the fellowship of science ; and for many years past we have watched with cordial appreciation the great labours of our German colleagues in the service of suffering humanity. All the deeper, therefore, is our sorrow when we see German science taking the lead among the nations, not in allaying suffering, but in inflicting it, and applying all its experience and ingenuity to devising methods of warfare more cruel and more indiscriminate than civilised Europe had ever known before. English science, too, though it acts in self-defence and may never be driven to such inhuman uses, is bound to concentrate itself on the terrible tasks of war. All the world over, indeed, Science, the pioneer of knowledge and the guardian of health, has become the handmaid of destruction ; and since from age to age her power to destroy, as well as to guide and heal, has steadily increased, the death-roll has been heavier in this than in any previous war.

Happily there is another side to this sad picture ; for if the mortality on the battlefield has never been so high, never have armies been so well cared for ; never has their worst enemy, disease, been so firmly held at bay ; and never have so many of the wounded been restored to

life and health. It is fitting on this occasion to offer our tribute of admiration to that large body of our profession who, old and young, on sea or land, amid the perils of the battlefield or the ceaseless toil of the hospital, are giving all the courage and skill they have to save the dying and to comfort those in pain.

And now may I take your thoughts for a brief hour from the tragedy that presses so hardly on us all, and fulfil, as best I may, the honourable charge which has been laid upon me ?

When, in the year before his death, William Harvey laid down his office of Lumleian Lecturer, to which he had been appointed forty-one years before, he bore witness to his love for this College by the gift to it of his Burmarsh estate to found in perpetuity the Annual Feast and Oration that bears his name. The holder of the office which I to-day unworthily fill was enjoined by the founder to commemorate the benefactors of the College by name, and encourage its Fellows to follow their example ; and further to exhort the Fellows and Members “ to search and study out the secrets of Nature by way of experiment, and also for the honour of the profession to continue in mutual love and affection among themselves.” The roll of benefactors is constantly increasing, but still conspicuous upon it stands Harvey’s name. He

was our pioneer in experimental research into the secrets of Nature ; whilst none more worthily than he maintained the honour of the physician or did more to contribute to that mutual esteem which is the salt of our calling. If therefore I attempt to carry out his injunctions in the spirit rather than the letter, it is because it seems to me that in Harvey's life and work we possess the pattern and example of all that is contained in them.

It may be thought unnecessary to recount the story of that life and work, yet in this College, especially, the oft-told tale will surely bear repeating, if only to remind us of him who first lighted the torch that, handed on from generation to generation, is ever more and more revealing the mysteries of existence.<sup>1</sup> Apart from the uninspiring pages of official records, and what may be legitimately inferred from his own writings, the chief source of our knowledge of the man Harvey comes from the biographical notes of John Aubrey. Aubrey relates that he first saw Harvey at Oxford after Edgehill fight, "but was then too young to be acquainted with so great a doctor. I remember he came several times to Trinity College to George Bathurst, B.D., who had a hen to hatch egges in his chamber, which they dayly

<sup>1</sup> There is, of course, nothing to add to the interesting life-story which has been so well told by Willis, D'Arcy Power, and Norman Moore ; whilst as regards Harvey's connection with the College there is ample information in Dr. Munk's edition of the College Roll.

opened to discern the progres and way of generation." It was not till 1651 that Aubrey made Harvey's personal acquaintance. He tells us that he consulted him with regard to a projected visit to Italy, and he speaks of Harvey's willingness to advise him and of the injunctions he gave him as to what there was to see, what company to keep, and what books to read, especially recommending for his study the works of Aristotle, Cicero, and Avicenna, and deriding the moderns or neoterics. From this time until Harvey's death Aubrey must have become more or less intimate with the now venerable physician, and he has preserved for us many details of his life and of his shrewd sayings. And when on June 26th, 1657, all that was mortal of Harvey was laid to rest at Hempstead, in Essex, escorted beyond the City walls by the President and Fellows of the College of Physicians, Aubrey "was at his funerall and helpt to carry him into the vault."

Full of interest are Aubrey's fragmentary jottings of the personal appearance of Harvey—his short stature, "round-faced, olivaster complexion"; his "little eie, round, very black, full of spirit; his haire black as a raven but quite white 20 years before he died"; of his being "like all the rest of the brothers very cholerique," and of such facts and reports as his "riding on horseback with a foot-cloath to visit his patients, his man following on foot, as

the fashion then was, which was very decent, now quite discontinued” ; also how “ all his profession would allowe him to be an excellent anatomist, but I never heard of any who admired his therapeutique way ” ; how “ he did not care for chymistrey,” and then this illuminating passage : “ I have heard him say, that after his booke of the Circulation of the Blood came out, that he fell mightily in his practize, and that ’twas beleevved by the vulgar that he was crack-brained : and all the physitians were against his opinion, and envyed him : many wrote against him, as Dr. Primige, Paracisanus, etc. (*vide* Sir George Ent’s booke). With much adoe at last, in about 20 or 30 years time, it was recieved in all the Universities in the world : and as Mr. Hobbes sayes in his book ‘ De Corpore,’ ‘ he is the only man, perhaps, that ever lived to see his owne doctrine established in his life time.’ ”

There is, however, one period of Harvey’s life of which we would fain have had particulars, even were they as slight and fragmentary as those of Aubrey, and that is the period of his youth and adolescence. The oldest of seven sons of Thomas and Joan Harvey, of Folkestone, he survived all but one of them—Eliab—who, like most of the rest, was a prosperous City merchant, to whom William entrusted the management of his financial affairs, and at whose house at Roehampton he died. There

were also two sisters, one of whom died in childhood, and the other, the youngest of the family, married George Fowke, and died about 1645. We know that William entered the King's School, Canterbury, at the age of 10, in the year of the Armada, and that five years later he proceeded thence to Caius College, Cambridge, the selection of medicine as his profession having probably then been made. And we can imagine that he had already in his pursuits and disposition shown a bent towards this study. It may well have been that in his leisure time the boy was already evincing that love of Nature and her secrets which was the dominating passion of his after life. His lectures and his writings show that of all authors whose works he had most studied, none was so cherished or so familiar as Aristotle, and he may well have been attracted to this father of natural history by his own observations of animal life. Dr. Moore tells us that in the "Prælectiones" Harvey refers to the anatomy of more than eighty species of animals, and was evidently familiar with it from his own dissections. His two published works abound in illustrations taken from the animal kingdom, among which may be specially mentioned his personal observations of the Bass Rock and its feathered habitants in the Treatise on Generation (11th Exercise); and Aubrey remembered hearing him say "he wrote a booke *De insectis*, which he

had been many years about, and had made curious researches and anatomicall observations on them. This booke was lost when his lodgings at Whitehall were plundered in the time of the rebellion. He could never for love nor money retriue them or heare what became of them, and sayd 'twas 'the greatest crucifying to him that ever he had in all his life.' ” Is it not then legitimate to imagine that the foundations of this passion for biology were laid in boyhood, by observation of the fauna of the waters of the Channel that bathed his native town, of the neighbouring Romney Marsh, and of the meadows and woodlands around Canterbury? Was he recalling some youthful adventure in the Kentish fields when, in after days, he made the famous comparison of Lord Bacon's eyes to those of a viper? <sup>1</sup>

Thus developed (we may well believe) in his school days, and doubtless strengthened during his studentship at Cambridge, his leanings towards the study of biology must have been finally confirmed when at the age of 20 he entered on a four-year course at the University of Padua. For Padua was then the very Mecca of anatomical learning. The chair of anatomy had been occupied successively by three illustrious men—first and foremost by the great

<sup>1</sup> Aubrey, speaking of Bacon, says: “He had a delicate, lively hazel eie: Dr. Harvey told me it was like the eie of a viper.” (“Brief Lives,” edited by A. Clark, 1898, vol. i., p. 72.)

Vesalius, then by Fallopius, and now, and for more than thirty years past, by Fabricius. To sit at the feet of Fabricius students flocked from all Europe, and Harvey formed one of an English circle which included some who were one day to be his colleagues in our College. As to the teaching of Fabricius when Harvey was his pupil, I cannot do better than repeat the words of the late Sir Michael Foster in those inimitable lectures on the History of Physiology which he delivered at the Cooper Medical College, San Francisco, in the autumn of 1900. After quoting from the published writings of Fabricius, which he says are merely repetitions of Galenic doctrine, “with here and there a modern touch,” and calling to mind that the writer was a favourite pupil of Fallopius, who was in turn the favourite pupil of Vesalius, he concludes as follows :—

“He had probably heard Fallopius tell many a saying of Vesalius, many an expression of the great man’s not embodied in the written work. He probably bade his hearers take Vesalius’s great work as their textbook, that great work in which Vesalius, by his insistence on the value of original inquiry as against the mere following of authority, and no less by the free expression of his doubts concerning current doctrines and of the need of putting these to the test of examination, had boldly cleared the way for future research. Even if he had not read Servetus, he must have been familiar with Columbus’s book : and both of these (we may lay on one side for the moment the possible connection between the two) had declared against the mysterious passage through the solid septum and in favour of the flow through the lungs,

from the right side to the left side of the heart. He could not have been ignorant of the writings of Cæsalpinus, who had so boldly expounded his views as to the action of the heart, and the flow along the veins from the tissues to the heart. He himself had contributed that knowledge of the valves of the veins which, rightly used, overturned the whole Galenic doctrine. Yet it was then as it is now to-day, as it has been in every period between then and now, as it was in all times before, and as it will be so far as we can see in all times to come. So strong was the hold upon his mind of conceptions coming down from the past, that Fabricius's eyes were blinded to facts staring him in the face, and his ears were deaf to voices crying out new views. At almost the very parting of the ways he continued calmly to preach that the old way was the better one, the way in which men should walk."

Sir Michael adds :—

"It was left for a pupil of his to seize that which he had just failed to lay hold of, to weld together, as he was passing away, into one sustained and convincing argument the several links which he and the rest had furnished, and nine years after his death to make known to the world that true view of the circulation which was the real beginning of modern physiology."<sup>1</sup>

That pupil was the young Kentishman who, when he left Padua at the age of 24, bearing the diploma of Doctor in Medicine, also took away with him the incentive to emulate the example set by Vesalius and, yet more strikingly, by the ill-fated Servetus, to explore for himself the arcana of Nature, and to draw from his own observations and experiments infer-

<sup>1</sup> "Lectures on the History of Physiology" (Cambridge University Press), 1901, p. 41.

ences which even Galen, whose doctrines had dominated medical science for 1,400 years, had failed to grasp.

It was this College, of which he had become a Fellow in 1607, and to which he was throughout his life devotedly attached, that gave to Harvey the opportunity of expounding the new views he had formed concerning the bodily mechanism. His appointment in 1615 to be the Lumleian Lecturer shows the esteem in which he was held by his colleagues and their recognition of his merits as an anatomist. During the years that had intervened since his return from Padua he had been engaged in practice in London and in 1609 had become physician to St. Bartholomew's Hospital; and there can be no doubt that in addition to these daily cares he was devoting all the time he could spare from them to study and dissection.

By a fortunate circumstance the manuscript notes, in his crabbed writing, of the first course of lectures he gave were preserved in the Sloane collection, and acquired by the nation in 1753.<sup>1</sup>

<sup>1</sup> On the initiative of the late Sir Edward Sieveking the College, in 1886 published a facsimile reproduction of these "Prælectiones" with a faithful transcription of each sheet made by Mr. Edward Scott, of the Manuscript Department of the British Museum. In so doing the College not only did honour to Harvey, but earned the gratitude of all who value the personal data of great men. In the preface to this work, and in his article contributed to the Dictionary of National Biography, our present Harveian Librarian has summarised the contents of the volume, and shown how vividly they bring the lecturer before us, and how they illustrate at once the depth of his learning, the extent of his personal observations and research, the exhaustive character of his exposition, and the homeliness of his

Now, although in his description of the heart as given in these notes Harvey does not enter into such detail as in his famous treatise which appeared twelve years later, he yet indicates plainly that he was aware of the transit of blood through the lungs, and that, passing into the left ventricle by the pulmonary veins, it was impelled into the aorta by the ventricular contraction, and returned to the heart through the systemic veins, of which he mentions the valves, as demonstrated by Fabricius. Let me repeat once again the note with which the description of the heart closes, for it is the first intimation of Harvey's view of the circulation, and is therefore of the most profound historical importance.<sup>1</sup>

“ It is plain from the structure of the heart that the blood is passed continuously through the lungs to the aorta as by two clacks of a water-bellows to raise water.

illustrations. On the first of these heads I may venture to quote one passage from Dr. Moore's biographical sketch: “ The lectures show the author to have been widely read. He had studied Aristotle and Galen evidently in Latin editions, and had a profound veneration for Aristotle, and a professional respect without much personal admiration for Galen. He quotes Aristotle oftener than any other author, and after Aristotle, Galen. He was familiar with all the anatomists from Vesalius to his own times, and had Columbus, Fallopius, Fernelius, Laurentius, Nicholaus Massa, and Bauhin at his fingers' ends. Of the Latin poets he cared most for Virgil, and knew Plautus and Horace: and of the prose writers, Cæsar, Cicero, and Vitruvius. He had read St. Augustine, and was well versed in the Bible. He does not mention Shakespeare nor any of the literature of his time, though he often quotes verbal remarks of his contemporaries, chiefly, however, of physicians.”

<sup>1</sup> It was quoted by Sir E. Sieveking in his Harveian Oration, and his translation, though more literal, is perhaps less fluent than that given by Mr. D'Arcy Power, which is cited above.

“ It is shown by the application of a ligature that the passage of the blood is from the arteries into the veins.

“ Whence it follows that the movement of the blood is constantly in a circle, and is brought about by the beat of the heart. It is a question, therefore, whether this is for the sake of nourishment or rather for the preservation of the blood and the limbs by the communication of heat, the blood cooled by warming the limbs being in turn warmed by the heart.”

In speaking of the liver, which was regarded by Aristotle and Galen as the great factory of the blood, Harvey in these “ *Prælectiones* ” alludes to the difference of opinion between philosophers and physicians as to the exact share taken by the heart and the liver respectively in this process. And he quaintly adds :—

“ If I could show that I have seen, it were at an end between physicians and philosophers, for the blood is rather the parent of the viscera than these of it, since the blood exists before the viscera, appearing in the ovum in the form of drops from the mother. Life is in the blood, which is the creator of native heat, and primarily prevails.

“ Thus I have seen in the presence of Dr. Argent all parts perfected whilst the liver is still unformed : the heart with its red auricles and the liver a shapeless mass, the heart very pale, the blood being collected in the purplish auricle.”

Dr. Argent was not then President, but he became so nine years later, and it is to him, whom Harvey styles his “ very dear friend . . . the excellent and accomplished President of the Royal College of Physicians, and to other learned Physicians, his most esteemed Colleagues,” that he addresses the preface of the small work pro-

duced at Frankfort in 1628 which revolutionised biological doctrine, and formed the starting-point of modern physiology. The "*Exercitatio Anatomica De Motu Cordis et Sanguinis Animalibus*" is in its way unique, both from a literary and a scientific aspect. The desirability of this public exposition of his views had been pressed on the author by those who for "nine years or more" had witnessed his demonstrations and listened to his arguments, and he undertook it feeling that he had the support of his colleagues in setting forth the facts of Nature, even though these ran counter to accepted beliefs. His main object was to ascertain the truth, and he felt sure that this could not be opposed by impartial minds, however hallowed by antiquity the errors that were dispelled might be.

"My dear colleagues," he says in his Preface, "I had no purpose to swell this treatise into a large volume by quoting the names and writings of anatomists, or to make a parade of the strength of my memory, the extent of my reading, and the amount of my pains; because I profess both to learn and to teach anatomy, not from books, but from dissections; not from the positions of philosophers, but from the fabric of Nature; and then because I do not think it right or proper to strive to take from the ancients any honour that is their due, nor yet to dispute with the moderns, and enter into controversy with those who have excelled in anatomy and been my teachers, I would not charge with wilful falsehood anyone who was sincerely anxious for truth, nor lay it to anyone's door as a crime that he had fallen into error. I avow myself the partisan of truth alone; and I can, indeed, say that I have used all my endeavours, bestowed

all my pains, on an attempt to produce something that should be agreeable to the good, profitable to the learned, and useful to letters."

It may be difficult for us in these days, when the passion for priority in publishing even the most insignificant of scientific researches so widely prevails, to understand why Harvey allowed so long a time to elapse before making known his discovery to the world at large. Yet it is not improbable that, had he been as precipitate in its publication as is the young enthusiast of to-day, the result might not only have been disastrous to his reputation, but would probably have arrested the progress of science. He had the wisdom, combined with the modesty, of the man of genius, to be content to lay his facts repeatedly before the select tribunal of those best qualified to judge of their merits. He thus gained time to test the truth of his views by renewed dissections and experiments, and thereby to obtain additional arguments in their support. It was no light task to undertake, for it was subversive of the central principles of such physiology as had been accepted without question for generations, and involved the denial of dogmas based on authority which even those who had gained glimpses of the truth did not venture to dispute. Indeed, however long delayed and carefully prepared, the publication of his book demanded high moral courage. An Englishman in 1628, it is true,

could not have shared the fate of Servetus, who, sixty-three years before, had perished at the stake, at the instance of Calvin, for the promulgation of heretical doctrine in a theological treatise (the “*Restitutio Christianismi*”) which also contained a no less heterodox statement, that the blood does not pass from the right to the left side of the heart through the septum, as Galen taught, but wholly through the lungs.<sup>1</sup> But Harvey was bound to rouse strong opposition in the world of learning. Among those who were privileged to attend his demonstrations there must have been several who came away unconvinced, especially among the senior Fellows, who could hardly be expected easily to rid themselves of the cherished convictions of a lifetime, and who, doubtless, would fain have detected a flaw in the reasoning which threatened to destroy the citadel of their scientific faith. There were probably some, too, who would have preferred to ignore the whole question, or to repeat the cry of “*Cui bono?*” which is ever raised over new ideas by the indolent and indifferent. They might have contended, as indeed in the next genera-

<sup>1</sup> As compared with Servetus, Harvey, whilst questioning the teaching of Galen, did not forget how much was owing to that great man, who together with Aristotle had pointed out the true way to study the structure and functions of the animal body. Indeed, as our late much-esteemed colleague Dr. Payne said in his learned Harveian Oration, without Galen there might have been no Harvey, since in the former's writings there is testimony to the true spirit in which the interpretation of Nature is to be attempted, with reflections on function as well as on structure, just as we find in Harvey.

tion the gifted Sydenham obviously did, that for the knowledge and treatment of diseases the great essential was accurate bedside observation, and but a minimum of anatomical knowledge. Dr. Payne, in his "Life of Sydenham," points out that that great physician "never once in his writings mentions the name of Harvey, nor does he seem to have had any notion of the importance of Harvey's discovery. Probably, had he been asked about it, he would have said no doubt all this was quite true, but that it made no difference to practical medicine." <sup>1</sup>

The distinction, one might almost say the antagonism, between the scientific and the practical in medicine has been maintained even in our own day, insomuch that not so long ago it was generally believed that the pathologist made a poor practitioner—a belief, happily for suffering humanity, frequently falsified. Now, however, unless I am mistaken, owing doubtless to the remarkable progress in recent years of pathological and bacteriological research, the trend seems in the other direction. Is there no danger of the real art of medicine in the observation of disease being overshadowed by resort

<sup>1</sup> This obscurantist attitude, as I fear it must be called, precluded him from forthwith understanding the real nature of dropsy, for although its causes were "at that time imperfectly ascertained," yet "Sydenham did not recognise what was actually known, nor what was being discovered by his contemporaries, the anatomists, who were engaged in carrying on the work of Harvey."

to the more rapid methods of diagnosis revealed by scientific research? Clinical medicine rightly takes advantage of every aid, instrumental or other, which science can furnish; but it would surely be disastrous were the practitioner to rely solely on such guidance and neglect the trained exercise of his own senses and judgment, and thus prefer the findings of the laboratory to the teachings of the bedside. Trousseau, troubled at the indications, even in his day, of this tendency to suffer scientific knowledge to supplant individual observation and reflection, could not refrain from the appeal to his class: "For mercy's sake, gentlemen, let us have a little less science and a little more art." Thus, although we are justly proud of the achievements of those engaged in the investigation of the nature and causes of disease, and welcome every new fact that adds to our ability to treat or prevent it, yet surely we can still equally applaud the gains to knowledge furnished by painstaking and exhaustive clinical observation. Science and Art are the two sides of the shield of medicine, and as such are typified on the portal of this building in the statues of their chiefest exponents—Harvey and Sydenham.

But if some of his hearers would not, and others, perchance, dared not accept his novel doctrine, there can be no doubt that it was favourably received by those many enlightened men whose encouragement led to its publica-

tion. It is, I am aware, quite superfluous for me to dwell at any length on the contents of this remarkable book. It is known the world over, and has of late in Willis's translation been included in a popular series of the English classics. And yet on this occasion, if any, it is well to be reminded what was the precise nature of the debt that mankind owes to Harvey in this pioneer work on physiology, which, by overturning the Galenic doctrine as to the functions of the blood and heart, altered the whole conception of the mechanism of the living body.<sup>1</sup>

<sup>1</sup> This doctrine is so succinctly set forth by Sir Michael Foster in the lectures to which I have already referred that I cannot do better than cite his description: "The parts of the food absorbed from the alimentary canal are carried by the portal vein to the liver, and by the influence of that great organ are converted into blood. The blood, thus enriched by the food, is by the same great organ endued with the nutritive properties summed up in the phrase 'natural spirits.' But blood thus endowed with natural spirits is still crude blood, unfitted for the higher purposes of the blood in the body. Carried from the liver by the vena cava to the right side of the heart, some of it passes from the right ventricle through innumerable invisible pores in the septum to the left ventricle. As the heart expands it draws from the lungs through the vein-like artery (or, as we now call it, pulmonary vein) air into the left ventricle. And in that left cavity the blood which has come through the septum is mixed with the air thus drawn in, and by the help of that heat which is innate in the heart, which was placed there as the source of the heat of the body by God in the beginning of life, and which remains there until death, is imbued with further qualities, is laden with 'vital spirits,' and so fitted for its higher duties. The air thus drawn into the left heart by the pulmonary vein at the same time tempers the innate heat of the heart and prevents it from becoming excessive. Thus from the right side of the heart there is sent to the body generally along the great veins, and to the lungs along the artery-like vein (the pulmonary artery), a flow, followed by an ebb, of crude blood endued with natural spirits only, blood serving the lower stages of nutrition. Blood flows through the artery-like vein (the pulmonary artery) to the lungs, for the nourishment of the lungs, just as it flows through the other veins for the nourishment of the rest of the body; in both cases

Harvey's line of argument, which was borne out step by step by anatomical and experimental facts, naturally falls into two parts. It did not suffice conclusively to prove that the course of the blood from the right to the left side of the heart can only take place by one route, through the lungs, but he had to show also that it was the same blood that returned to the right side by passing from the arteries into the veins. He had indeed shown that the septal pores had no existence in fact (indeed, since the anatomical renaissance which began with Vesalius, they were only to be discerned by the eye of faith) ; that the ventricular diastole, instead of being the active agency for drawing blood into the chamber, was really passive, the contraction of the auricle impelling its contents into the ventricle, which by its systole sent the stream onward into the arteries, coincidentally with the cardiac impulse, and creating the arterial pulse, while the accepted notion

there is an ebb as well as a flow along the same channel. From the left side, on the other hand, there takes place along the arteries to all parts of the body a flow, followed also by an ebb, of blood endued with vital spirits, and so capable of giving power to the several tissues to exercise their vital functions. As this blood passes from the left heart along the vein-like artery (pulmonary vein) to the lungs it carries with it the various fuliginous vapours which, in the fermenting activity giving rise to the vital spirits, have been extracted from the crude blood, and discharges these vapours into the pulmonary passages. Arterial blood—i.e. blood laden with vital spirits—reaching the brain, there generates the 'animal spirits' which, pure and unmixed with blood, existing apart from blood, are carried along the nerves to bring about movements and to carry on the higher functions of the body."

—*Loc. cit.*, p. 13.

of an ebb and flow was wholly dispelled by recognition of the valvular mechanism, which determined the direction of the current, and effectually prevented any such reflux. Yet he realised that up to this point the demonstration was incomplete, and with characteristic candour and simplicity he breaks off in the middle of his exposition to explain how he was forced to the conviction that there must be a general as well as a pulmonary circulation, in those memorable passages of the eighth chapter which cannot, I think, be too often quoted :

“ Thus far I have spoken of the passage of the blood from the veins into the arteries, and of the manner in which it is transmitted and distributed by the action of the heart : points to which some, moved either by the authority of Galen or Columbus, or the reasonings of others, will give in their adhesion. But what remains to be said upon the quantity and source of the blood which thus passes is of so novel and unheard-of character, that I not only fear injury to myself from the envy of a few, but I tremble lest I have mankind at large for my enemies, so much doth wont and custom, that become as another nature, and doctrine once sown and that hath struck deep root, and respect for antiquity influence all men. Still the die is cast, and my trust is in my love of truth and the candour that inheres in cultivated minds. And sooth to say, when I surveyed my mass of evidence, whether derived from vivisections and my various reflections on them, or from the ventricles of the heart and the vessels that enter or issue from them, the symmetry and size of these conduits—for Nature, doing nothing in vain, would never have given them so large a relative size without a purpose—or from the arrangement and intimate structure of the valves in particular, and of the other parts of the heart in general, with many things

besides, I frequently and seriously bethought me, and long revolved in my mind, what might be the quantity of blood which was transmitted, in how short a time its passage might be effected, and the like ; and not finding it possible that this could be supplied by the juices of the ingested aliment without the veins on the one hand becoming drained, and the arteries on the other getting ruptured through the excessive charge of blood, unless the blood should somehow find its way from the arteries into the veins, and so return to the right side of the heart ; I began to think whether there might not be A MOTION, AS IT WERE, IN A CIRCLE. Now this I afterwards found to be true ; and I finally saw that the blood, forced by the action of the left ventricle into the arteries, was distributed to the body at large, and its several parts, in the same manner as it is sent through the lungs, impelled by the right ventricle into the pulmonary artery, and that it then passed through the veins and along the vena cava, and so round to the left ventricle in the manner already indicated."

In the succeeding chapters, in which he proves the need for a passage of the blood from the arteries to the veins, in fact for a systemic circulation, he is constantly recurring to almost the only deductive argument of his whole demonstration, namely that the amount of blood unceasingly flowing through the heart and arteries is far in excess of any that could be furnished from ingested material or needed for nutrition. It runs like a refrain through each chapter, in which he adduces further proofs of such a circulation, such as the fact that by division of an artery the whole body can be drained of its blood ; that with a failing heart the blood tends to accumulate in the veins, leaving the arterial

system more or less depleted at death ; that during life the flow in the systemic veins is of necessity from the periphery towards the centre ; and that the impossibility of a flow in the contrary direction is proved by the effects of ligation and the valvular mechanism of the veins. Had he depended on anatomical knowledge alone he might have made a shrewd guess at his great discovery, but he could not have proved it without taking advantage of direct observation of the mechanism in action. Galen was familiar with the cardiac valves, but did not comprehend their action. Vesalius denied the existence of the septal pores, but did not grasp the truth as to the pulmonary circulation. Servetus, who arrived at this truth, still believed that the blood was drawn into the heart by the ventricular diastole ; and Fabricius, though he had minutely described the valves of the veins, could not realise their significance in determining the direction of the blood-flow and opposing the reflux postulated by the Galenic doctrine. But Harvey, who had observed the formation of the blood and heart in the developing chick, and grasped the import of the foetal circulation—how, when at birth the short-circuit from the right to the left heart was closed, the only route left must be through the lungs—was not content with anatomy alone. He supplemented its teaching by experiment and observation of the action of the heart in the living animal. He

studied its motions in all classes of animals, invertebrate as well as vertebrate ; he noticed how the auricular contraction coincided in time with the ventricular diastole, and the ventricular systole with the apex beat, the dilatation and pulsation of arteries, and how the latter was due to the systolic shock, producing a wave in the blood column, and not to the movement of the arterial wall. He showed the direction of the flow of blood by the division of vessels, and how the veins could be emptied by a wound of a large artery ; how by compression of the cava in a snake the heart became pale and empty, resuming its normal character on removal of the obstruction, whilst if the aorta were similarly treated the organ became overdistended. Applying similar methods to the human limb, he demonstrated the effects of a tight ligature in arresting the flow in both artery and vein, and how, by relaxing the compression, the flow in the artery returned, while the still obstructed veins became turgid, as when a fillet is applied to the arm for phlebotomy ; and by a like simple experiment he demonstrated the function of the valves in the veins, and the invariable course of the blood-stream towards the heart.

Although we are fortunate to possess other writings of Harvey on the subject of the circulation, notably his two disquisitions addressed to John Riolan the younger, and letters to various correspondents abroad, they do not add

materially to the facts he had published in his "De Motu" twenty years before.<sup>1</sup>

He himself had no misgiving as to the importance of his discovery, and its bearing on the problems which beset the physician. For he says, in the course of his work, "reflecting on every part of medicine, physiology, pathology, semeiotics, therapeutics, when I see how many questions can be answered, how many doubts resolved, how much obscurity illustrated, by the truth we have declared, the light we have made to shine, I see a field of such vast extent, in which I might proceed so far and expatiate so widely, that this my tractate would not only swell out into a volume, which was beyond my purpose, but my whole life, perchance, would not suffice for its completion."

I may now take leave of Harvey. The yield from the seed he planted has been abundant,

<sup>1</sup> These writings attempt rather to correct false views than to adduce new facts. It is, however, noteworthy that, in spite of the support given to the new doctrine by the discovery of the lacteals by Aselli in 1622, and of the receptaculum chyli and thoracic duct by Pecquet in 1651, Harvey, writing to a correspondent in the latter year, and referring to these advances, seems indisposed to admit that the lacteals were really chyliferous. Another interesting point is his appreciation of the difficulty of explaining how the blood finds its way from the arterioles into the venules. He rejects the notion of a direct anastomosis, since did this obtain the blood might sometimes flow backward from the veins into the arteries; and suggests, somewhat tentatively, that the union is rather by an oblique inosculation, much as the ureter enters the bladder, or the bile-duct the duodenum, whereby such a reflux would be obviated. He did not live to learn of the discovery of the capillaries by Malpighi, which was made known to the world four years after his death, and set the final seal of truth on Harvey's grand induction.

but its full garnering is not yet finished. For, vast as have been the additions to biological knowledge since Harvey lived, there remains much to be revealed, and the doors still closed can only be forced open by Harvey's methods and Harvey's lifelong diligence in their application.<sup>1</sup> And in the wider field of medical science as a whole, where the march of progress can never halt as long as men are mortal and suffer from disease, there is no better inspiration for each new generation of researchers than to remember that Harvey had the courage of his convictions and followed and revealed the truth before a world of prejudice and error.

The impetus given by the discovery of the circulation to the study of animal functions was not confined to the solution of physical problems. It also proved to be the starting-point of attempts to explain the relationship between mind and body, which still engage the thoughts and test the ingenuity of the wisest. It is far from my intention, as it is indeed far beyond my power, to try to thread the mazes of

<sup>1</sup> Harvey's endeavours to penetrate the mysteries of generation, incomplete and fragmentary as they may seem to the modern embryologist, must have occupied his thoughts from youth to old age, for it was probably at Padua that he was first led to this study by his master Fabricius, who was then immersed in it; and in the work that, at the entreaty of his friend Sir G. Ent, he reluctantly allowed to be published, the names of Aristotle and Fabricius continually appear.

philosophical speculation on this intricate and difficult subject, but it may be of interest briefly to refer to the opinions of two of Harvey's contemporaries, one of whom became his personal friend, and was remembered by him in his will. These men were René Descartes and Thomas Hobbes, who have each been respectively compared to our modern exponent of philosophy, Herbert Spencer, the one as regards his biological and the other for his sociological writings.<sup>1</sup>

The late Professor Huxley, who in some of his most interesting essays did much to enlighten us on the work of Descartes, for whom he had unbounded admiration, speaks of him as having plainly set forth and anticipated the lines of modern physiological inquiry, doing for motion and sensation what Harvey did for circulation and generation.<sup>2</sup> In the famous

<sup>1</sup> Sir Michael Foster, speaking of Descartes, says: "We may perhaps speak of him as the Herbert Spencer of the age. In so far that his treatise on man bore somewhat the same relation to the physiological inquiries of the time as the *Principles of Biology* do to the biological researches of the present day." ("Lectures on the History of Physiology," p. 58.) Leslie Stephen, referring to Hobbes, says: "Hobbes appears to have been the first writer who clearly announced that 'civil philosophy' must be based upon 'natural philosophy,' or, in other words, that a sound 'sociology' must be based upon scientific knowledge. He may be called a Herbert Spencer of the seventeenth century, and, in spite of very wide differences, there is a certain resemblance between the two thinkers. Each of them aims at exhibiting a complete system in which the results of the physical sciences will be co-ordinated with ethical and political theory." ("Hobbes," *English Men of Letters*, p. 73.)

<sup>2</sup> Speaking of the enunciation of the truth that "the physical processes of life are capable of being explained in the same way as other physical phenomena," which marks the "first half of the

“Discourse on Method,” a veritable human document, Descartes tells how in order to arrive at certainty and truth he set aside all the learning he had acquired in his education, and endeavoured to attain his end by the exercise of his own reason and observation. In that way, as Huxley puts it, he “consecrated doubt,” not in the spirit of the scoffing sceptic, but in that of the earnest inquirer, bent on arriving at the truth which lay hidden somewhere in this world of illusions. The results of his researches were summed up in the memorable phrase, “Cogito, ergo sum.” For in his search for reality he

seventeenth century as one of the great epochs of biological science,” Huxley proceeds: “If we ask to whom mankind are indebted for this great service, the general voice will name William Harvey. For, by his discovery of the circulation of the blood in the higher animals, by his explanation of the nature of the mechanism by which that circulation is effected, and by his no less remarkable though less known investigations of the process of development, Harvey solidly laid the foundations of all those physical explanations of the functions of sustentation and reproduction which modern physiologists have achieved. But the living body is not only sustained and reproduced: it adjusts itself to external and internal changes; it moves and feels. The attempt to reduce the endless complexities of animal motion and feeling to law and order is at least as important a part of the task of the physiologist as the elucidation of what are sometimes called the vegetative processes. Harvey did not make this attempt himself; but the influence of his work upon the man who did make it is patent and unquestionable. This man was René Descartes, who, though many years Harvey’s junior, died before him; and yet, in his short span of fifty-five years, took an undisputed place not only among the chiefs of philosophy, but amongst the greatest and most original of mathematicians; while, in my belief, he is no less certainly entitled to the rank of a great and original physiologist, inasmuch as he did for the physiology of motion and sensation that which Harvey had done for the circulation of the blood, and opened up that road to the mechanical theory of these processes which has been followed by all his successors.” (“Animal Automatism,” *Collected Essays*, vol. i., p. 200.)

found no foothold save in the recesses of his own mind, or consciousness, through which alone he obtained knowledge of the outer world, and indeed of his own existence. The mere mechanism of the body, constructed on similar lines in all animals, set man and brute together on the level of automata. It was in the possession of mental powers, of reasoning faculties, that man rose above that level, and differed from the rest of creation. For man alone had a rational soul, which endowed him with personality, consciousness, and thought. This was the one reality, and in its exercise all doubt would be dispelled. Yet in order to bring this immaterial entity into intimate relation with the body he did not hesitate to find for it a local habitation in the pineal gland, a structure that was common to both man and brute, but tenanted in man alone.

Hobbes, who, like Descartes, was a mathematician, arrived at very similar conclusions in regard to the mechanism of life, and he was similarly influenced by the light shed by Harvey's discovery. But whereas Descartes carried his speculations farther, and convinced himself that the thinking thing, that which marked out the individual, was the real substance through which man was made conscious of the external world and of his own existence, Hobbes saw no necessity for such an assumption, and considered thought to be as much a

property of the body as sense or, as we should term it, sensation. Thought and sense were but kinds of motion, and in this conception the human mind as well as the body were not only made one, but linked in the same vast chain as the heavenly bodies whose motions had been demonstrated by Galileo. "Motion was the one universal phenomenon," and the movements of material atoms explained the mystery of life and the operations of the mind, equally with the vast cosmical changes that mark the birth of worlds. Hobbes, therefore, in his analysis of the mental faculties and emotions, which forms the first chapters of the "Leviathan," does not treat psychology as other than an integral part of the organisation of Man. For in his first sentences he says "concerning the Thoughts of Man" that the "originall of them all is that which we call Sense: (For there is no conception in a man's mind, which hath not at first, totally, or by parts, been begotten upon the organs of Sense.) The rest are derived from that originall." And again: "There is no other act of man's mind, that I can remember, naturally planted in him, so, as to need no other thing, to the exercise of it, but to be born a man, and live with the use of his five Senses. Those other Faculties, of which I shall speak by and by, and which seem proper to man onely, are acquired, and encreased by study and industry; and of most men learned by instruction and

discipline ; and proceed all from the inventions of Words and Speech. For besides Sense, and Thoughts, and the Trayne of thoughts, the mind of man has no other motion ; though by the help of Speech, and Method, the same Faculties may be improved to such a height as to distinguish men from all other living creatures.”<sup>1</sup>

Psychology has travelled far from the standpoint either of Descartes or of Hobbes, and yet the great problem of the real relation between body and mind remains unsolved. Many links have been forged between the psychical and the physical, yet the two remain apart, like parallel lines that never actually blend. Science frankly recognises this, for whilst unwilling to confess that any facts in the universe are beyond explanation by pursuance of her methods, she is not ashamed to admit that the sphere of mental activities has yet to be conquered. As Prof. Karl Pearson says : “ What the actual relations between the psychical and physical aspects of thought are we do not know, and, as in all such cases, it is best to directly confess our ignorance. It is no use, indeed only dangerous, in the present state of our knowledge with regard to psychology and the physics of the brain, to fill the void of ignorance by hypotheses which can neither be proven nor refuted.”<sup>2</sup> The crude conceptions of the two

<sup>1</sup> “ Leviathan,” Cap. I. and III.

<sup>2</sup> “ The Grammar of Science,” 3rd ed., p. 48.

seventeenth-century philosophers have been refined and expanded, and their mutually antagonistic propositions have been reproduced in other terms ; but the essential questions remain without an answer, namely, Is that which we call "mind" merely a function of a corporeal brain, or is the brain, strictly speaking, simply the organ of an immaterial mind ? <sup>1</sup>

But, while these questions still remain unanswered, the methods pursued by science in the investigation of living nature have, especially in our own day, added greatly to our knowledge of the functions of the brain and nervous system. The pioneer researches of Hitzig and Ferrier on cerebral localisation, followed up by other physiologists, and supplemented by histological studies of the cortex, have done much to open up a new field of thought in respect to the higher cerebral functions, in which the doctrine of the neurone takes no small part. These researches go far to suggest that definite cortical regions represent the physical substrata of particular mental faculties, and thus tend to re-establish the fanciful phrenology of Gall on a new and sounder basis. So that from one point of view the grey matter takes the place

<sup>1</sup> That the cerebral mechanism is intimately associated with mental action is self-evident, and the evolution of a nervous system in the animal kingdom runs *pari passu* with that of the objective phenomena of consciousness exhibited in purposive acts and movement.

of the pineal gland of Descartes, and from another the doctrine of Hobbes is justified when he states that "sense" is the "originall" of all "thoughts." But in deducing from the facts of anatomy those of function, is there no risk of overstepping the boundary between fact and hypothesis, and in so doing of rather retarding than promoting the discovery of truth? However that may be, the comparatively recent introduction of experiment into the investigation of mental states has already added much to our knowledge, and promises to add much more; and it has fortified the claim of psychology to be ranked among the sciences, a claim which might be challenged so long as its methods were confined to mere introspection.

Now progress in this field must of necessity be slow, and it may plausibly be argued that until we have obtained as much knowledge of the working of the mind as physiology has given us of the working of the body our efforts at a rational treatment of its disorders are in vain. But in fact there is no ground for an outlook so despairing. Indeed, is not much of the most successful treatment of physical disease still necessarily empirical, or at any rate based on the results of clinical and pathological observation, rather than on physiological principles? And although we must be content to remain ignorant of the real nature of mind, there is yet an enormous and still untraversed area for research into the

causation and characters of the insanities, and we are warranted in basing the most sanguine hopes as to the possibility of their prevention and control on the results which investigation of that vast area may yield. It is, therefore, our first duty to explore it ; for, as practical physicians, it is far better for us to concentrate our efforts on gaining assured knowledge of the ascertainable facts concerning the conditions that conduce to the different forms of mental defect, than to be led away into the seductive paths of metaphysical (or even of psycho-physical) speculation in the vain endeavour to explain the phenomena of thought and consciousness.

Before referring to the directions in which already much progress has been made, and the promise there is of further gain, I may very briefly speak of the changes in the conception of insanity which have not only led to the humaner treatment of its victims but also to its being studied on scientific lines.

The belief in witchcraft and in dæmonic possession was one of the most ancient of superstitions, and was implicitly incorporated into Christian faith owing to Scriptural sanction and the doctrine of a personal devil. In this country there was no period in which these beliefs were more strongly held than in the reign of James I., when a special Act was passed declaring all such alleged practitioners of the black arts to be

“felons without benefit of clergy.” In the succeeding reign we find Harvey, as the King’s physician, deputed, together with the two Court surgeons, to select ten midwives to examine for stigmata the persons of four women brought as prisoners from Lancashire to London, accused of the practice of witchcraft.<sup>1</sup> Although with the dawning of natural science these beliefs were slowly yielding to common sense (as witness the statement of the sturdy Hobbes, that “as for Witches I think not that their witchcraft is any real power ; but yet that they are justly punished for the false beliefs they have”), the superstition still prevailed, even among the thoughtful and learned, of whom Sir Thomas Browne is always cited as a notable instance. And although the penal laws have been long repealed, there are, I fancy, still traces of this strange belief in some of our remoter villages, a belief which now and again finds expression amongst the insane. And in regard to insanity itself, I may once more quote from Hobbes, whose pithy reference to it seems to have anticipated in one regard the argument of our distinguished colleague that the conduct of an insane person is the chief index to his derangement. Here are a few passages :

“Dejection subjects a man to causeless fears : which is a Madnesse commonly called Melancholy. . . . In summe,

<sup>1</sup> It is pleasant to record that in the cases of three of these unfortunates the result of the search was negative, and in the fourth doubtful.

all Passions that produce strange and unusuall behaviour, are called by the generall name of Madnesse. But of the severall kinds of Madnesse, he that would take the paines, might enrowle a legion. . . . If some man in Bedlam should entertaine you with sober discourses: and you desire in taking leave, to know what he were, that you might another time requite his civility: and he should tell you, that he were God the Father: I think you need expect no extravagant action for argument of his Madnesse. . . . Again, that Madnesse is nothing else, but too much appearing Passion, may be gathered out of the effects of Wine, which are the same with those of the evill disposition of the organs. For the variety of behaviour in men that have drunk too much, is the same with that of Mad-men: some of them Raging, others Loving, others Laughing, all extravagantly, but according to their severall domineering Passions. . . . The opinions of the world, both in antient and later ages, concerning the cause of Madnesse, have been two. Some deriving them from the Passions: some from Daemons, for Spirits, either good or bad, which they thought might enter into a man, possesse him, and move his organs in such strange, and uncouth manner, as madmen use to do.”<sup>1</sup>

Under the influence of the same kind of belief as that which actuated the persecution of people suspected of witchcraft, and the subjection of thousands of innocent women to trials, tortures, and the stake at the hands of the law, the attitude of the community towards those who were the subjects of insanity was no less barbarous. It was a mysterious affliction, and those suffering from it were either shunned as outcasts or made mock and sport of for their harmless follies, or, if of violent propensity, confined and chained in dark cells for years, and subjected to the most

<sup>1</sup> “Leviathan,” Cap. VIII.

drastic treatment, including systematic flagellation, periodical blood-letting, and potent drug-ging. An instructive sidelight upon this attitude is furnished by the fact that when Dr. Richard Lower desired to demonstrate the operation of transfusion before the Royal Society, he sought, with the sanction and support of that body, to obtain his subject for the experiment from among the patients at Bethlem Hospital. The physician then attached to the establishment, Dr. T. Allen,<sup>1</sup> very properly refused his permission ; but in spite of this, Lower seems to have attained his end,<sup>2</sup> for he relates in his “*Tractatus de Corde*” how he held his demonstration and carefully injected several ounces of sheep’s blood into the vein of a certain A. C. who was afflicted with a harmless form of insanity, without any inconvenience to the patient. Lower adds—and this may be taken as in some degree justifying his choice of such a subject—“Indeed, the results were so satisfactory to him that we resolved to repeat the operation from time to time in order to relieve his insanity, and would have done so, if he had not consulted his own inclination rather than his health, and thus frustrated our expectations.” This experiment was carried out about ten years after Harvey’s death, and shows how entirely his doctrine of the circulation was then established. One may

<sup>1</sup> “*Roll of the Royal College of Physicians*,” 2nd ed., vol. i., p. 361.

<sup>2</sup> *Ibid.*, p. 381.

add, perhaps, that according to modern knowledge the admixture of nine or ten ounces of sheep's blood with that of a human being would involve a risk of hæmolysis that few would now venture to incur.

There is happily no need to dwell on what is perhaps one of the saddest episodes in the history of civilised humanity. We are all aware of it, and none more so than the members of this College. For over fifty years the College of Physicians was responsible for the licensing and inspection of private "madhouses" within an area of seven miles of the metropolis; but, owing mainly, it is said, to the limitation of their statutory powers, they did little to ameliorate the condition of the patients or remedy notorious abuses. Nor did the formation of a Board of fifteen Metropolitan Commissioners in place of the College to guard the interests of the insane within the area in and around the metropolis lead to any general improvement; but when, owing to an Act passed in 1842, their powers of visitation were extended to the provinces, and they produced in 1844 their memorable Final Report, the way was made clear for thorough dealing with the subject. The result was the Act of 1845, identified with the name of Lord Ashley (subsequently Earl of Shaftesbury), whereby the Lunacy Commission, of which he became chairman, was created, and the whole legal procedure remodelled in the

interest of the insane. The Act also provided a complete scheme for the visitation of all institutions and private houses in England and Wales, where the insane were treated. The Acts of 1890 and 1891 introduced additional safeguards for the protection of the insane, and gave opportunity to the community to take a wider interest in this helpless class by placing the provision and control of county and borough asylums in the hands of local authorities. The net result of all this beneficent legislation has been the multiplication throughout the land of public institutions where the insane can be properly housed and cared for, a corresponding diminution of establishments carried on for private gain, and an increasing disuse of workhouses as places for the permanent detention of chronic pauper lunatics.<sup>1</sup> But yet, although in the seventy years since the Act of 1845 the number of county and borough asylums has grown from twenty-six to ninety-seven, with an increase in the individual average accommodation from about 250 to nearly 1,100, there is an ever-pressing need for further extension, to cope with the growing accumulation of chronic cases.

The modern public asylum is a very different place from its early prototype. The long, ill-lighted corridors, with the rows of rooms, or

<sup>1</sup> This last-mentioned aim is still far from being attained, except in the metropolis, where care of such cases has devolved on the Metropolitan Asylums Board.

“cells,” as they were not inappropriately termed, on each side, the small high-barred windows, and the lofty walls which encircled the building, gave to the old asylum the character of a gaol, whose inmates were for the most part prisoners for life, “the world forgetting, by the world forgot.” The change in the character and surroundings of the buildings devoted to this purpose, which renders the modern asylum the very antithesis of the old, is but the outward and visible sign of the more rational views that have come to be held concerning mental affections and their appropriate treatment. I need not particularise the various directions in which the improvement in the treatment of the insane has been insensibly brought about, but I may be permitted to point out that the credit of almost every advance is owing in great measure to the earnest and unselfish endeavours of those members of our profession who have been in responsible charge of asylums. From the time when Conolly of Hanwell led the way in the abolition, in large public establishments, of measures of restraint and coercion for the excited and refractory, until to-day, every change has been initiated with the one object of benefiting the subject of insanity. For his status has been recognised as that of a patient who needs to be treated with tact and consideration, to be afforded the means of regular occupation and harmless recreation, to be placed, in fact, in as

suitable an environment as possible for the *vis medicatrix* to promote the restoration of the mental balance, strengthen the enfeebled will, and enable him to regain the power of self-control ; and this by means that may be termed moral rather than medicinal. I may cite one instance of the value of asylum treatment. It is based on the statistics of the past ten years, which show that, with an annual admission-rate into county and borough asylums of 20,000, more than one-fifth were known to have suicidal propensities. Yet the yearly average of actual suicides among patients received into these institutions during the same period was only twenty-five, of whom five committed the act before admission and six whilst on trial or after escape. Thus, while upwards of 4,000 persons were admitted with this tendency, there were only fourteen suicides within the asylum, including a few in whom this proclivity was not suspected. This striking fact illustrates both the vigilance that is exercised over such cases, and also the remedial effect of asylum life upon the individual patient. The advantages of small over large asylums, in respect to more comfortable and homely surroundings, as well as to more individual treatment, are counterbalanced in the latter by greater facilities for the classification of patients according to the type of their mental affection and their bodily infirmities, and also by the provision of separate buildings for

the reception of acute and recent cases, of convalescents, and of the workers. The recovery-rate in the county and borough asylums is as much as one-third of the annual admission-rate, and although fully one-fourth of those discharged as recovered may return subsequently owing to relapse, yet the number permanently restored to reason and capable of resuming their normal life and occupation is still considerable. That there is constant need for further increase of asylum accommodation by no means proves, as has sometimes been suggested, that the amount of occurring insanity is increasing under the stress and strain of modern life. It is simply due to the fact that the losses by death and discharge are invariably surpassed by the gains from admissions, and therefore the numerical increase of the insane depends mainly on accumulation.<sup>1</sup> And it may be added that the prevalent conception of the hopelessness of insanity is not borne out by experience, for although with every additional year of residence the chances of permanent recovery dwindle, there are numerous instances where the mental balance has been restored, even after many years of derangement.

The asylum, in fulfilling its primary object as a place of safe retreat for those whose mental condition disables them from taking part in the

<sup>1</sup> *Vide* Appendix, "On the Alleged Increase of Insanity."

battle of life, or whose unnatural conduct and loss of self-control render them unsocial, or even anti-social and a positive danger to the community, or who need to be protected from their own self-destructive impulses, has a further and no less important function to perform. It affords exceptional facilities for the study of insanity in all its varied forms and manifestations, and for thorough investigation of etiological and pathological problems. There are in this College many Fellows and Members distinguished for the valuable contributions they have made to psychiatry, gleaned by applying the principles and methods of medical science to the observation of the disorders of the mind. The duties of asylum medical officers, in addition to those bearing directly on the treatment of their patients, include the keeping of clinical records, from which statistical and other data can be compiled, while several institutions have for many years afforded facilities for laboratory research. Every encouragement should be given to those who have a bent for such research, and I do not speak for myself alone when I note with satisfaction the tendency to improve the conditions of the medical officer's tenure of office, and thereby to enable him to pursue as a career what otherwise might only be a fleeting incident in his professional life. I hope we may see the day when, in respect to scientific work, the asylums for the insane in various localities

may become affiliated to universities in their vicinity, so that workers in such centres may be enabled to draw from many sources the material needed for research, which might thereby be conducted on definitely co-ordinated lines. To secure this aim special legislation would be necessary, but there should be no difficulty in obtaining it. We already have in London an example which might well be followed in the country at large. For its central laboratory, established at Claybury<sup>1</sup> several years ago, which it is now proposed to transfer to the new hospital founded by the munificence of Dr. Maudsley, has at its disposal the resources of ten county asylums whose inmates number over 20,000. Nor should the excellent work in this direction that is being done in several provincial centres pass unnoticed. I need only refer to the long-established laboratory at the Wakefield Asylum, memorable as the scene of Ferrier's historical researches on cerebral localisation and the publication of the West Riding Reports under the ægis of Sir James Crichton-Browne more than forty years ago; the important anatomical and pathological investigations carried on at the large Lancashire asylums; and the facilities for biochemical as well as biological research afforded by the well-equipped labora-

<sup>1</sup> The published "archives" of the work of the Claybury laboratory carried on under the direction of our distinguished colleague, Dr. F. W. Mott, are replete with researches bearing on problems of nervous and mental diseases.

tory established at their asylum at Whitchurch by the Cardiff City Council. These are only the chief centres of such work, but in many another county or borough asylum the scientific spirit has found its opportunity and has made to the common stock many a contribution that merits recognition. The field of scientific inquiry into mental phenomena will further be widely extended in the near future, when under the Mental Deficiency Act the increase in the numbers of institutions for all grades of the feeble-minded and imbecile affords scope for detailed clinical observation and investigation by experimental methods.

The remarkable progress made within comparatively recent years in our knowledge of the finer anatomy of the brain, in its developmental evolution, and in the exact determination of its sensory and motor centres, has also led to the simplification of the idea of its morphology, as consisting essentially in a vast system of "neurones," upon the integrity of which the normal working of the whole cerebral mechanism depends. This conception involves assumptions of the precise relation between structure and function which are beyond demonstration, but the correctness of which is borne out by the parallelism that seems to exist between the degree and development of mental faculties and that of anatomical structure. By years of patient micro-

metric observations of the depth of the several cell-layers in the cortex, Dr. Shaw Bolton arrived at the conclusion that the physical explanation of mental defects and disease is to be found in imperfection of neuronc development on the one hand and in neuronc degeneration on the other. His researches, embracing the cerebra of the sane as well as the insane, have led him to group all departures from the normal into the two great divisions of Amentia and Dementia. In proportion to the extent of the arrest of development of these systems of cortical cells and fibres, which are essential to the conduction and reception of sensory stimuli and the association of impressions that go to form the higher mental processes of thought and memory, we may expect to find a greater or less deficiency of mental power. And, in the other direction, the advance of a degenerative process in the neurone is necessarily accompanied by a progressively increasing mental degradation.

At first sight it might appear that these incontrovertible facts of anatomical observation must inevitably lead to a pessimistic view as to the prospect of permanent recovery from an attack of insanity. For if from imperfect development or from progressive decay the channels of nervous impulse are lacking or abolished, how can the higher cerebral functions be carried on, and the psychical processes they subserve be otherwise than permanently enfeebled or deranged? But

although it may be granted that Nature cannot add to the stock of neurones with which the child is born into the world, or restore the integrity of those which have become degenerate, much can still be done by promoting the functional activity of the residual normal elements, or in preventing the tendency to decay by the removal of conditions that contribute to it. Herein, even on this belief, lies the justification for affording the congenitally feeble the opportunity of receiving in childhood such education and training as is appropriate to the various grades of mental defect; whilst in those whose mental failure arises in later years, much can be done by the alteration of their environment and conditions of life to protect them from the stress that has been in great measure responsible for their breakdown. There would be far fewer cases of recurrent insanity were it possible to ensure to patients on their return to their normal avocation a like protection from personal cares and anxieties to that which the asylum had afforded.

It is easy to correlate Dr. Bolton's histological facts with the doctrine of a neuropathic tendency in the family histories of insane patients. The hypothesis of the existence of such a tendency seems to be necessary to account for the fact that agencies which apparently conduce to an attack of insanity in some individuals have no such baneful result in the majority. The careful and

detailed inquiries into insane heredity which for the past few years have been carried on under the supervision of Dr. Mott, and the numerous instructive pedigrees that have thus been compiled, go far to establish the fact of such neuro-pathic inheritance, of which mental instability is one factor. They go farther in demonstrating how this tendency may be intensified by a comingling of two tainted stocks to such an extent that Nature at length steps in and checks the unrestricted multiplication of the unfit by lessening the vital resistance of the progeny, or, on the other hand, mends the defect by the grafting of a sounder stock on to the family tree.

One must admit that the hope of improving the mental stability of the race, apart from the adoption of Utopian eugenic measures, lies largely in the direction of prevention of exposure to conditions which are acknowledged more or less directly to favour mental derangement. Among these are certain agencies, two at least of which could be greatly influenced by social reform, and thus brought within the control of the State. The best-known is the abuse of alcohol, of which the toxic effects are exemplified in delirium tremens, and in chronic dementia of the habitual drunkard,<sup>1</sup> but it is not easy to determine how

<sup>1</sup> " The fact that personal addiction to alcohol appears from these returns to have been regarded as a factor in 26·3 per cent. of male and 10·4 per cent. of female cases of first attacks of insanity ought not perhaps to be too literally interpreted. Such a return implies that in these proportions these insane persons were admittedly intemperate ;

far the alcoholic habit is itself due to mental weakness, which in its turn contributes to the result.

There is an even more direct connection between syphilis and insanity, for, apart from cases of cerebral syphilis in which there are mental symptoms, there is now unquestioned proof of the association in the remarkable and fatally progressive affection in which motor and psychical symptoms are so strikingly combined, and which has long been regarded as a definite form of insanity, under the head of paralytic dementia or general paralysis of the insane. It is more than forty years since Fournier advanced the thesis that syphilis played a part in the pathogeny of tabes dorsalis. Then came the recognition that the degenerative changes in the brain in general paralysis were analogous to those in the cord in tabes, and that not infrequently the two affections were combined.

The part played by syphilis in the etiology of general paralysis came also to be recognised, but in either affection it was difficult to account for the long interval of years that elapses between infection and the nervous lesions. This difficulty

and the estimate requires to be controlled by an analogous census of the same class of individuals who do not become insane; and also to allow for cases where inebriety is as much a consequence as a cause of mental deficiency. . . . Nevertheless, it is beyond dispute that alcoholic excess does contribute to mental derangement, and we may, in support of this statement, simply record the fact that in 11 per cent. of the male and 4 per cent. of the female patients this factor was the only one which could be assigned as the causal agent."—67th Report of the Commissioners in Lunacy, p. 26.

was met by Fournier's introduction of the term "parasyphilis," as indicating that the neuronie degeneration was the outcome of nutritional changes originally initiated by the syphilitic infection. The positive reaction yielded by the Wassermann test in the great majority of cases of general paralysis, and Noguchi's discovery of the spirochæte in the cerebral cortex, clinched the argument. For they pointed to the conclusion that throughout the years that elapse between the initial lesion and the cerebral manifestations, the parasite responsible for exciting the latter must have been lying latent. Thus the term parasyphilis is no longer justified; and Dr. Mott, to whom so much is owing for this demonstration, is convinced that not only is there no general paralysis without syphilis, but that it is possible to estimate the incidence of the latter in a community from the amount of the former.<sup>1</sup>

There is another and, as many think, a more hopeful path by which to attain to a true con-

<sup>1</sup> "Now that everybody is ready to recognise the principle which I have long advocated, 'No syphilis, no general paralysis or tabes,' we may hope that some prophylactic measures will commend themselves to the Legislature. When we reflect that every year 15 per cent. of the male admissions are suffering from this disease, and that the sufferers are drawn from a good type of individual in all grades of society, fathers of families in many instances, and without a neuro-pathic inheritance, men who were of civic worth before this fatal disease attacked them, we may well ask whether something should not be done to prevent the cause."—F. W. Mott, Supplement to the 68th Report of the Commissioners in Lunacy, p. 83.

ception of mental disorder, and often to its successful treatment.<sup>1</sup> But it is a path not easy to traverse ; for it has been encumbered with theories and speculations which, with all their plausibility, are not only difficult to accept, but, in some respects, positively repugnant to reason. It may well be that these excrescences from what is in itself an attractive doctrine are by no means essential to it, and I gather that not all of Prof. Freud's disciples feel bound to follow him in the later developments of his psychological phantasies. The central hypothesis provides a reasonable basis for the explanation of many of the most characteristic symptoms of mental disorder, and it is affirmed that, working on this hypothesis, by means of psycho-analysis it is possible to "pluck from the memory a rooted sorrow"—to eradicate a long-held delusion, and so to restore the balance of the mind. I do not feel myself in a position to estimate how far these affirmations are correct ; but it is the duty of medical science to weigh them carefully, and not to reject them out of hand, owing to certain drawbacks and dangers which their general acceptance might involve. Many of these drawbacks and dangers are obvious enough. The necessity

<sup>1</sup> For a concise and clear exposition of the essentials of this new teaching see Dr. Bernard Hart's manual, "The Psychology of Insanity" (1912). In the Morison Lectures this year Dr. Stoddart gives details of the practice of psycho-analysis ("The New Psychiatry," 1915); whilst in his 3rd Lumleian lecture on "Some Modern Theories Concerning Hysteria" (1914), Dr. Ormerod discusses the subject impartially and critically.

in many cases, for example, of prolonged “ mental vivisection ” may, as Dr. Ormerod has pointed out, induce a morbid frame of mind, and thus tend rather to increase than diminish the patient’s instability. Then, too, there must be grave risk of the practice of psycho-analysis falling into ill-trained and perhaps unscrupulous hands, or even of its degenerating into a fashionable cult. It is clearly not in the same category as hypnotism, but, like hypnotism, it ought not to be condemned merely for the reason that it is open to abuse.

I have sketched, in the briefest outline, the progress which has been and is still being made in the treatment of the insane, and the study of insanity. And now I wish to close with an appeal, as emphatic as I can make it, for the removal of an obstacle—formidable indeed, but not, I hope, unconquerable—by which the further course of this progress is sensibly checked and hampered.

Every physician must admit the vital importance, from the point of view both of scientific study and of appropriate treatment, of giving a patient the advantage of skilled advice and care *in the earliest stages* of a malady. Yet in the case of insanity this obvious advantage can often be secured only with the greatest difficulty, and often not at all. Now this drawback, peculiar to insanity, appears to be largely owing to a rooted misconception of the nature

of mental disease, a persistence in the public mind of mediæval ideas of possession and the like, giving rise to an aversion consciously or subconsciously felt for anything associated with lunacy. The law is not to blame. If the provisions of the law, framed, it must be recalled, entirely in the interest of the insane, were repealed to-morrow, the so-called "stigma" would still persist. For certification, whilst providing legal justification for that deprivation of personal liberty which is absolutely necessary for the safety and welfare of the individual patient, does not add anything to the fact of his insanity. And until that stigma is removed, as it can and ought to be, there will be very little progress in the direction of remedial as compared with preventive treatment, and the opportunity for fruitful scientific observation of the early phases of mental disorders will be mainly lost.

It is, I fear, of small use in this direction to carry out schemes for reception houses and hospitals for incipient insanity, and to facilitate their work by postponing resort to legal restrictions for a more or less limited period. The theoretical value of such institutions in enabling many sufferers to be treated for acute and transient derangements without the necessity of undergoing the formalities now requisite for their detention may be conceded; and it may perhaps be added that they would afford relief to the authorities from the unpleasing

duty now imposed on them of enforcing the penal clauses of the Lunacy Acts. But, unless the attitude now assumed by the majority towards mental affections were wholly changed, it would not be long before treatment in such an institution would come to be regarded in the same light as detention in an asylum. For it is really the insanity that is the shameful thing, and not the fact of compulsory detention and the civil disabilities that follow from it.

It may be urged, again, that a relaxation of the law would enable the mental sufferer to place himself voluntarily under treatment. Yet how often would not this object be frustrated by his refusal to enter an institution? Or, if persuaded to do so against his will, would he not take the first opportunity of leaving, should he find it to his distaste? For he could not be retained there, since compulsory deprivation of liberty can only be sanctioned by legal enactment—a fact not seldom lost sight of, not merely in cases of alleged insanity, but occasionally in the course of modern medical treatment of the psychoneuroses. Is it desirable or fair that medical practice should thus be brought into conflict with the law of the land? Ought not the profession rather to use its undoubted influence with the community to break down the barrier which prevents so many sufferers from obtaining the full benefit of expert knowledge?

We no longer chain and flog the lunatic ;

but is it really much less cruel to weaken his chances of recovery in the first stage of the disease by refusing to face the facts or by furtively concealing them, and then, when the disease has taken root, to regard the sufferer, however kindly we may treat him, as practically an outcast from the human race? As long as we continue, in this enlightened age, to separate mental disease, on grounds of instinct or superstition rather than those of reason, from all the other ills that flesh is heir to, as long as we allow ourselves to be repelled by the taint of insanity as we were once repelled by the taint of leprosy, or to be afraid of lunatics as we were once afraid of witches, so long the real stigma will rest not on the insane but on ourselves. It is Harvey's title to fame that he fought the popular opinion of his day and made the truth prevail; it is for us in Harvey's spirit to remove from the path of science and humanity this last encumbering relic of the Middle Ages.



## APPENDIX

### ON THE ALLEGED INCREASE OF INSANITY

THE ever-increasing demand for asylum accommodation, while testifying to the growth of the numbers of insane persons detained under care, has not seldom led to the mournful conclusion that this denotes a steady increase in mental disorder throughout the civilised world. It is a natural inference, especially when supported by the fact that in all countries the insane community, as known to the authorities, has (since statistical returns have been made) been increasing at a greater rate than the general population. For example, in England and Wales, as the reports of the Commissioners in Lunacy show, the numbers under care have risen from 36,762 in 1859 to 140,237 in 1914, or an increase of 181·5 per cent., whereas the estimated population during the same period has increased from 19,686,701 to 37,302,893, or 89·5 per cent. The rate of increase varies from year to year, but in no year have the numbers been lower than in the preceding one. No doubt this may be partly explained by the fact that far more care is taken to place these sufferers under legal detention and protection than was formerly the case, and also, in a slight degree, to a gradual decline in the recovery- and death-rates in asylums.

The only sound criterion for determining whether or not there is a real increase of lunacy is that based on the numbers admitted to care who are attacked for the *first time*. Accurate information on this head is unfortunately of but recent date, and is limited to those received into institutions. The proportion of such cases of "first attack" to the number admitted has been almost uniform from year to year since 1907, when the more accurate statistics commence. It varies from 73 to 75 per cent., the remainder of the admissions

comprising cases of congenital and recurrent insanity, together with a certain number in which it was not possible to obtain definite information as to whether the patient had suffered before or not.

The following table gives the proportion per 10,000 of population borne by (a) the number under care in institutions at the commencement of each year, and (b) the number admitted during the year for a first attack of insanity :—

<i>Year</i>		<i>A</i>		<i>B</i>
1907	..	28.25	..	4.12
1908	..	28.52	..	4.15
1909	..	28.89	..	4.10
1910	..	29.09	..	4.08
1911	..	29.36	..	4.05
1912	..	29.64	..	4.15
1913	..	30.02	..	4.08
1914	..	30.19	..	4.26

These figures show that throughout this limited period of eight years the ratio of these "first attacks" to the estimated population has remained fairly constant, about 4 per

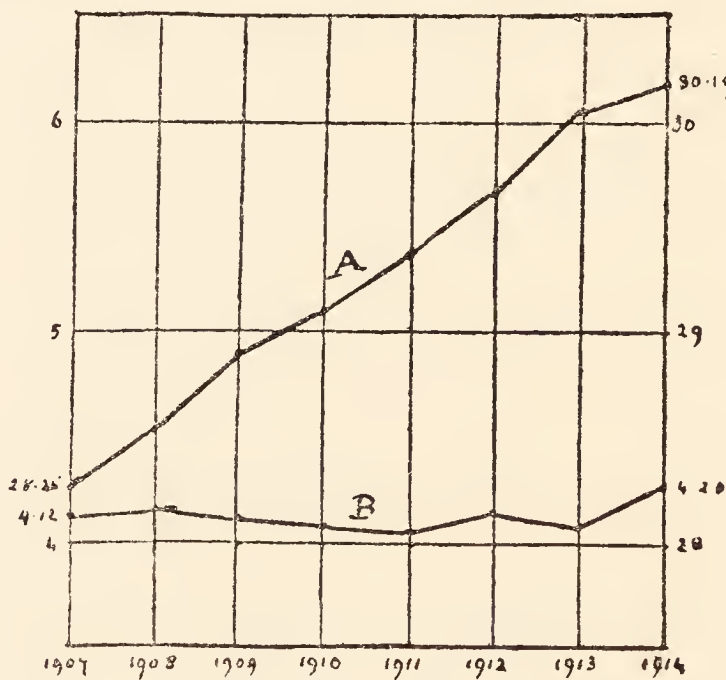


Diagram illustrating the annual proportion per 10,000 of population of (A) the insane under care in Institutions (England and Wales), and (B) those admitted during the year for a first attack of insanity.

10,000. On the other hand, the proportion borne by the total number under care has steadily risen from 28 to 30 per 10,000 (*see* diagram). Manifestly, therefore, this latter growth in numbers, which proceeds at a greater rate than does that of the population, can hardly be attributed to the increase of those attacked for the first time. If the above figures, derived from institutional records, fairly represent the whole of the (known) insane community, one must look elsewhere for an explanation of the annual increase in the number of the insane. This no doubt may be found in the readmission to care of patients suffering from recurrent attacks, whose names may figure in the admission list perhaps several times in the course of years. The tendency to a falling recovery- and death-rate will also increase the difference between the annual gains by admissions and the losses by discharge and death.

May we not hope that with a fuller knowledge of the etiology of insanity and the adoption of suitable measures of prevention, together with the removal of conditions conducive to recurrence, and also, possibly, the employment of more direct methods of treatment, there may be a sensible reduction in the number of the insane, with a lightening of the burden now borne by the community in providing for their care and control?









